

A Halbach Array Motor for Use Over a Wide Temperature Range, Phase I

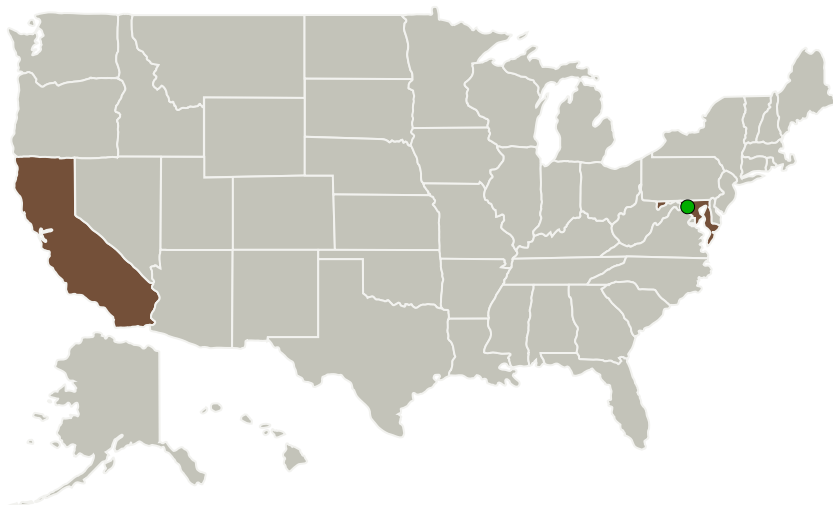
Completed Technology Project (2010 - 2010)




Project Introduction

Motors used in rovers, cranes and instruments for use on lunar and Mars missions present unique design requirements. Weight reduction is critical, so motors with high power density and torque density are desirable. Also, the motors need to be designed to work over a wide temperature range: from 40 K to 403K. The proposed axial flux, coreless, brushless, Halbach array motor has been demonstrated to have the highest power density and the highest efficiency in land based applications. In this phase I effort, the motor will be developed for use in lunar and Mars missions in which the operating temperature range is from 40 K to 403K. This would be a significant technical advancement.

Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|-------------------------|-------------|---------------------|
| LaunchPoint Technologies, Inc. | Lead Organization | Industry | Goleta, California |
|  Goddard Space Flight Center(GSFC) | Supporting Organization | NASA Center | Greenbelt, Maryland |



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Table of Contents

| | |
|--|---|
| Project Introduction | 1 |
| Primary U.S. Work Locations and Key Partners | 1 |
| Project Transitions | 2 |
| Organizational Responsibility | 2 |
| Project Management | 2 |
| Technology Maturity (TRL) | 2 |
| Technology Areas | 3 |
| Target Destinations | 3 |

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Primary U.S. Work Locations

California

Maryland

Project Transitions

 **January 2010:** Project Start

 **July 2010:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138725>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

LaunchPoint Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

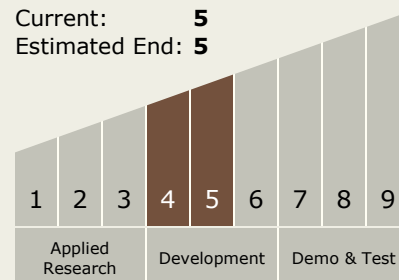
Carlos Torrez

Principal Investigator:

Michael Ricci

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.2 Electro-Mechanical, Mechanical, and Micromechanisms

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System